ORIGINAL : FRENCH

TELEPROCESSING : AN OPPORTUNITY FOR THE THIRD WORLD

by Raymond Aubrac

The data processing explosion and the changes in telecommunications, the two components of the "teleprocessing" revolution, afford a choice of society, perhaps of civilization. The elements of this choice, as concerns the French nation, are the subject of a debate opened by a highly official report, L'informatisation de la Société, (The Computerization of Society) written by Simon Nora and Alain Minc, and published in 1978 by la Documentation française. In this report the authors discuss the role of the State, advocate policies and outline the negative and positive aspects of several alternatives, depending on the development of awareness and the willingness to pursue particular courses of action. However, the report focuses on the situation of one nation, in an international context of developed countries which is dominated by the technical and commercial lead of the major partner, the United States. The analyses presented are probably valid for most wealthy countries which encounter the same economic, social and cultural problems as France, making allowances for the features of their particular situation.

However, teleprocessing knows no bounds, other than commercial ones. While the developed countries have to decide which role they will play on this market, that of supplier or customer, the developing countries must consider it from another perspective. Their chances of being partners in any other capacity than as the suppliers of

skilled and low-priced manpower to apply technologies conceived elsewhere are slim at the moment.

Data processing does, however, provide the poor countries with a more important instrument than simply a new avenue for trade: the means of gaining access quickly, and at little cost, to information which they require in order to tackle fundamental problems. There is reason to wonder if it is not the complement of, and may not one day become a partial replacement for, technical co-operation. Indeed, to a certain degree, the technical cooperant is the vehicle of information which he brings to the country receiving his services, and which he has obtained from the "sources" available to him. Whether a method of study or suppliers of equipment are required, the technicians of the recipient country will soon be able to gain direct access to these sources through data processing and modern communication systems.

It is true that in the last twenty years since the African and Asian countries gained independence, their development has given rise to a new dimension in international politics. The powers which had, until then, asserted themselves to the rest of the world through their diplomacy, trade and armed forces added to this apparatus development co-operation programs, which are now an integral part of their foreign policy. This new activity, while not always free of selfish considerations, developed in a context of international solidarity best exemplified by the United Nations and its specialized agencies. During this period, which has not yet ended and whose termination is in some cases delayed by the existence of coincident interests within the donor-recipient relationship, two series of important events have been noted:

. First of all, the poor countries, where the lack of management personnel was both a consequence and a cause of their underdevelopment, have made a considerable, and often successful effort to train the technicians, doctors and economists they lacked.

. Secondly, a scientific and technical revolution has taken place during this same period, providing the systems through which it is possible to collect, process and distribute information and, finally, to meet the challenge of an unprecedented growth in the store of knowledge. Documentary information retrieval makes it possible to deal with the staggering increase in knowledge by providing the means of classifying, selecting and, finally, using this information.

Access to knowledge is a requirement for progress. The poorest countries are beginning to be in a position to tap this resource. It remains to be seen who will control it.

Will a few very rich countries, which are producers and exporters of information and which have the means of processing and transmitting it, turn it into an instrument of hegemony? Or, on the contrary, will we witness a movement similar to that of the Encyclopedists who, guided by Diderot and d'Alembert, wished to turn knowledge into a instrument of universal progress?

The country first

The first task of documentary information retrieval in a developing country is to ensure the utilization of knowledge acquired within the country itself by permitting its retrieval. In this connection, there exists a paradox worth mentioning: the rich countries, which are great wasters of foodstuffs, clothing, gasoline and all kinds of manufactured products, are generally good at managing their information resources through their widely-distributed publications, made available in libraries, and their innumerable documentation services. On the other hand, in the poor countries, where all available food is consumed and where material goods are so scarce that they are generally used until completely worn out, domestic information is largely wasted. There are, of course, good reasons for such a state of affairs. For one thing, little publishing is done because of an inadequate market, and unpublished documents of which only a few copies have been produced are irretrievable except by their holders. The frequent changes in government structures and buildings and carelessness in the keeping of public documents are another cause of loss. Finally, it often happens - and did even more frequently in the recent past - that important studies are entrusted to foreign experts who exchange information with the professional community of their country of origin.

A growing number of developing countries are worried about this situation and have undertaken to correct it by laying the foundations of a national documentary infrastructure on a legislative, regulatory and technical level. Several different systems may be chosen, depending on the size of the country, the degree of importance and

priority given such a project by the government and on the external influences to which the latter is susceptible. The second task of documentary information retrieval in a developing country is, in fact, to provide access to those external information bases from which it can benefit and to which it can, in some cases, contribute.

All these tasks may be undertaken using manual and traditional methods. However, the prospect of rapidly and fully reaping the benefits of both developing national bases, once they have reached a certain size, and existing foreign or international bases leads most countries to choose the information processing system which will permit a swift transition to teleprocessing once communication systems are denser and less costly.

The fact that developing countries are anxious to derive benefit from external bases and to participate in their expansion, as well as to avoid having to pay the price of developing new software, quite naturally leads them to use the formats, vocabularies and software which are available to them. These countries must, therefore, make certain choices, just as the developed countries themselves have to choose between the increasingly simple and frequent use of American bases and the achievement of relative independence - in interdependence - as described in the Nora-Minc report.

As the moment, however, the choices open to the developing countries cannot be defined in the same terms.

As a first possibility, they could simply organize themselves with a view to becoming either paying or subsidized users of the major existing bases, most of which are American. By increasing the number of customers and consequently strengthening these bases, they could, with the help of American international co-operation programs, obtain software, personnel training programs, and perhaps even computers, which are becoming less costly now that mini-computers have come on the market. They would also benefit from the communication networks which, according to the Nora-Minc report, IBM intends to expand rapidly, by, for example, substantially increasing the number of bulk storage satellites. In that case, the developing countries will set up their national data bases as they think best, or perhaps not at all. This is a matter of little consequence as a strong international network is beginning to be set up. Assuming that this course is adopted, the developing countries will receive precisely what the others decide to give them without being able to participate in the management of the world infrastructure upon which they will become dependent.

Another possibility is that they could help to set up and manage, as well as use, an international system which has already been partly established under the auspices of United Nations agencies.

Expressing these choices in terms of alternatives, however, does not reflect the requirements of the actual situation, which, as often, is more complex. Many countries - not only France, but developing countries as well - participate in international systems using American,

English or European bases when they exist. However, the importance that developments in teleprocessing are going to have for the structure and, to an even greater extent, for the management of international information dissemination systems, both economically and politically, is worthy of special attention.

Beyond specialized areas, governments have to choose options, both on the international and national levels. The debates and resolutions of the United Nations Conference on Science and Technology for Development, held in 1979, could provide the proper guidance for future choices.

The United Nations and its specialized agencies such as UNESCO, the FAO, WHO, IAEA, ILO and others have as one of their basic missions the dissemination of information. This is accomplished through publications and meetings of experts in various fields, through libraries and scientific, technical, economic and social information processing systems. These services and systems, of which there are now a great many (more than a hundred), vary greatly in size and structure. Some exist within secretariats, with modest resources, and although they are available to Member States, they were in many cases established to meet internal requirements. Other systems are more ambitious and operate, or tend to operate, on the basis of international exchange and universal use. It is interesting to study their method of operation. As an illustration, we will take a look at the two largest systems now in operation: INIS, which covers the peaceable uses of nuclear energy (under the auspices of the International

Atomic Energy Agency) and AGRIS, which covers agricultural science and technology (under the auspices of the FAO).

With these systems, each country is responsible for entering the documentation produced on its territory by developing a bibliography and identifying the concepts under which the various documents must be classified to permit their retrieval. The contributions of each country are collected by the international agency, which puts them together in a coherent form, and provides the international community with the means of consulting this information store, on a monthly and cumulative basis. The entire process is computerized; in other words the processing centre receives the information on magnetic tape, and the computer provides a world tape as well as printed indexes for those users who lack the equipment needed in order to consult the tape. After a few years of operation, INIS now handles 80 to 90 percent of world information production, while AGRIS, which has a wider scope, handles around 50 percent (90 countries participate in AGRIS, which lists more than 10,000 documents per month).

The basic characteristic of these systems is that they are managed by an intergovernmental agency wherein each country shares in the decision-making. The impartiality of the information is therefore guaranteed. Also, actual expenses are proportional to the financial resources of the participating countries: the wealthiest ones provide the greatest amount of input, and the central processing budget, which is included in the budget of the international agency, is based on contributions which are proportional to the wealth of the member countries.

The rapid success of this new form of international co-operation cannot be wholly accounted for by the quality of the service it can provide. It involves the listing of publications and unpublished documents, and this task requires a selectivity which has not yet been achieved. In many countries, the responsibility for selection is entrusted to non-specialized personnel who do not have sufficient knowledge of the subjects treated to enable them to assess the value of the documents they select. Another shortcoming of this method of operation is the relative slowness of the process: it takes several months before a document can be brought to the attention of the reader, and if a well-stocked library is not available to him, he will have to wait several more months before obtaining the document. If the document listed has not been published, but only prepared for limited distribution, the national centre which listed it will be responsible for supplying a copy to the user, and this could cause still further delays.

If, then, these international systems, however imperfect they may be in their present state, arouse enough interest that their steady growth is an established fact, there must be reasons for it.

Reasons and possible explanations

The first reason seems to us to lie in the part these systems play in promoting the documentary infrastructure in many countries, and not always in the least developed ones. Participation in an international exchange often provides strong justification for putting in

order one's own national structures. Moreover, these systems provide, at no cost, methods, software and training opportunities which for many countries represent a chance to save both time and money.

The second reason is possibly a political one. The chance for all participating countries to oversee the management of the system, to formulate the rules of the game and to assert essential priorities removes the dangers of documentary hegemony and guarantees independence within interdependence. This sort of democratically-managed instrument, in the area of scientific and technological research, attracts the interest of those who wish to defend their culture, their language, their markets, or simply their freedom of choice.

If these explanations prove to be correct, one can imagine that scientific and technical information is likely to develop under international control. However, it will be necessary - and also possible, if adequate resources are allocated - to overcome the shortcomings that now exist in this area.

As a result of the advances which have been made in data processing and telecommunications technology, this information source will provide to its users throughout the world not only bibliographical listing services, but also personalized services, quick and accurate answers and summaries prepared by the most eminent specialists on urgent and important problems. Work now being actively pursued in several countries, including France, gives hope that the language barrier will also be surmounted.

Most of the techniques needed to organize a satisfactory international exchange among the producers and consumers of knowledge are now available. Were this kind of exchange to be thoroughly organized and put into operation, it would guarantee equal opportunities to all those who contribute by their daily work to the expansion of present-day knowledge. This would open up vast possibilities for international co-operation, to the advantage of the least privileged countries, where information requirements are also the greatest.

ASCOFAM F Information bulletin

Raymond Aubrac is a former director of the United Nationas Food and Agriculture Organization (FAO).

Illustration

Example: By the end of 1980, almost 3,000 households in the outlying areas of Paris will be able to use Télétel service. The terminal can gain access through the telephone system to local information banks or to remote information processing systems linked to the Télétel service by the telecommunications networks. It also receives information disseminated through the television network.

Diagram

1) User terminal

2) Telephone hook-up

3) Information transmitting networks

4) TV broadcasting network

5) Sources of information and local or remote services